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# Multiplying by Division: Mapping the Collection at University of North Texas Libraries

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## Abstract

The University of North Texas (UNT) Libraries has developed a unique collection assessment tool, the Collection Map, to provide support for a new access-based collection development philosophy. UNT Librarians realized the limitations of traditional assessment methods to gauge the impact of emerging acquisitions models such as demand-driven acquisitions (DDA) and large interdisciplinary e-book collections. What was needed was a flexible, nimble assessment system to track access, holdings, and interlibrary loan (ILL) activity for each academic discipline. The Collection Map is a database that links items, and their associated data, to any one of several dozen overlapping subcollections via Library of Congress call numbers (LCCNs). The Collection Map's unique many-to-many relationship of subcollections to items and data enables librarians to demonstrate support for subject areas and to make more informed collecting decisions. This article describes the components and creation of the Collection Map, including manipulation of existing systems to extract data.

## Introduction

The University of North Texas (UNT) Libraries Collection Development Department has developed a unique collection assessment tool, the Collection Map, to harness the power of available data and to provide increased purchasing flexibility. The Collection Map database links items, and their associated data, to any one of several dozen overlapping subcollections via Library of Congress call numbers. The Collection Map's unique many-to-many relationship of subcollections to items and data enables the library to demonstrate support for a wide array of subject areas, to make more informed collecting decisions, and to increase flexibility in purchasing. The Collection Map facilitates the compilation and analysis of data on multiple subject areas regardless of the original fund used to purchase the item, and regardless of the acquisitions model.

## A Traditional Past

Traditionally, UNT libraries collections purchases were organized into over 60 disciplinary "funds" allocated by a formula. These funds were used for

the tracking of funding availability and as a measurement of success. Funds utilized within this process were very narrow in scope due to the constraints of the organization and allocation process. Simultaneously, the monograph and journal collections within the UNT Libraries have undergone significant budget cuts for the past several years due to a variety of internal and external environmental factors. Collection selectors perceived that each available budget dollar was increasingly precious, and engaged in purchasing practices that included utilization of available funds to purchase items which were directly related to the discipline scope. Cooperative purchasing between funds was rare. Over time, maximization of resources or provision of support to major interdisciplinary purchases was reduced because funds were so segmented. Eventually we realized that allocation of money to these segmented funds could no longer ensure support for all areas in the collection adequately.

When creating reports and making decisions, key players relied heavily on data about materials based on what had been purchased from the individual funds. Every item was assigned to a single discipline by having been purchased using

that fund. This method of assessment did not provide a clear depiction of the resources relevant to each subject or discipline as collection assessments were being conducted based upon viewing the purchasing and patterns through a single, rigid lens. The allocated funds were being used in three approaches that were both simultaneous and conflicting. The three purposes of the traditional fund allocation process included: control of the funding spent on subject areas; evaluation of success in meeting our collection development goals; and demonstration of support for subject-based programs.

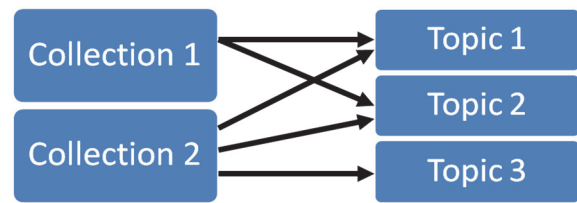
Recognizing the deficiencies with the existing process, we decided to develop a flexible, nimble assessment system to track access, use, holdings, and ILL activity for each subject area. We, as an institution, needed to gather, and use, better information about collections than could be obtained through the use of the traditional fund allocation approach alone. And, we needed more flexibility and decision-making support for funding larger, non-traditional, interdisciplinary purchases.

### **An Assessment-Based Future**

We stopped thinking in terms of funds, and started thinking in terms of call numbers. The classification of an item tells us much more about its relevance to multiple subject areas than the original fund used to purchase it.

Simultaneously, we created customized local collections that made sense to us, based on our needs. Usually these collections correspond to administrative or accredited units, like the Department of Philosophy & Religious Studies. We also made interdisciplinary collections of interest to research centers, minors, and special areas of emphasis, like LGBT and International Studies. We now measure access, purchasing, and use for dozens of these overlapping collections.

We now measure access, purchasing, and use for dozens of these overlapping collections (see Figure 1).



**Figure 1. A many-to-many relationship.**

In this way, we're able to do away with using budgeting as the primary (or only) method to design our collection—in other words, designating pots of funding to purchase discrete items in a certain subject area or format. The concept of “balancing” has become irrelevant; because the subcollections overlap to a high degree, the development for the whole collection is not zero-sum. Therefore, there is no need to allocate funds to each discipline. The test of success is no longer what we paid for, or even what we own. We changed the question: rather than asking “did we spend all of X fund,” we began asking “do we support the research and teaching in X area?” Success is no longer based on balancing, formulas, or expenditures. This only worked because we were able to decouple the funding availability from the assessment data. We achieved greater funding flexibility and purchasing power by desegmenting funds and creating one big purchasing pool.

In order to make these ideas work, we needed a way to represent *all* of the granular topics relevant to each discipline or program. We also needed a way to map *many* overlapping call numbers to *many* collections. We decided to create a database in which one call number can be assigned to multiple collections. This database can be constantly updated to reflect new needs, and can connect our needs for information (usually based on administrative or accredited units within the university) to data about holdings, use, ILL, and access.

### **Overview of the Collection Map**

Development of the Collection Map rested upon four key objectives and goals. The first was that

the creation of the Collection Map will allow for proactive assessment of the collections while also facilitating the ongoing monitoring of collections by format and subject. The second objective was to implement and complete the mapping of the WorldShare Conspectus subjects to the UNT Libraries's collections. The third objective was to initiate comparison of the WorldShare® holdings with the existing UNT collections, and the final objective during the development of the Collection Map was the creation of a sustainable method to map different items to the UNT collections based upon Library of Congress Call Numbers (LCCNs). The overarching focus of the creation of the Collection Map was an emphasis on sustainability, as the Collection Map is intended to be utilized by key players within the UNT library structure by mapping/matching different items, regardless of format such as books, videos, musical scores—anything with a Library of Congress Call Number to the UNT collections.

The WorldShare Collection Evaluation System (CES) was utilized in this process as it uses WorldCat® data, thus allowing for ongoing comparisons between and against peer-institutions, a set of peers, and authoritative lists (e.g., *Outstanding Academic Titles*). Additionally, the subject categorizations within CES are based upon the Western Library Network, which became the Research Library Group network conspectus with which many of the collaborators within the Collection Map development project were already familiar. Authorization to use the conspectus list from WorldShare was obtained by the UNT Collection Assessment Librarian, Karen Harker, prior to starting development of the Collection Map.

## Background

Historically, the YBP approval plan provided the foundation for the development of the UNT Libraries's collections. Within this process, LCCNs of interest to UNT Libraries were mapped to a single operating fund within the given fiscal year budget. This resulted in LCCNs being allocated to a single fund in a one-to-one relationship. As a result of connection between the YBP approval plan and the existing UNT Libraries's collections,

UNT Libraries at the initiation of this process had a total of 59 subject-based collections. This led to the mapping of the 59 UNT Libraries's subject-based collections to the 11,251 WorldShare Collection Evaluation System (CES) Conspectus subjects. Please see Figure 2. UNT collection map pathway. During the development of the UNT Libraries's collections the realization was reached that certain LCCN ranges could belong to one or more collections and indeed that they should be placed within more than one collection to truly reflect the interdisciplinary nature of the items within the collections.

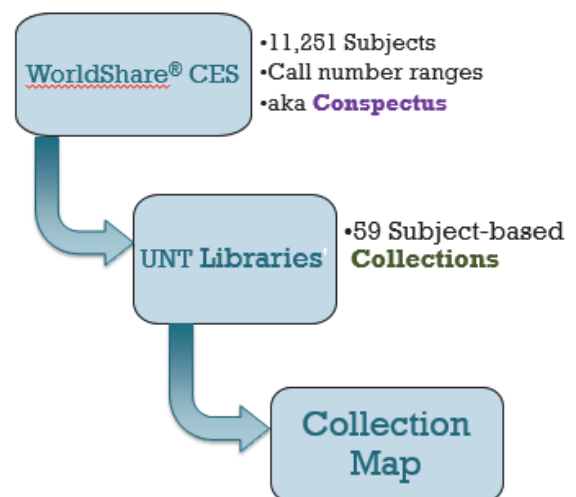
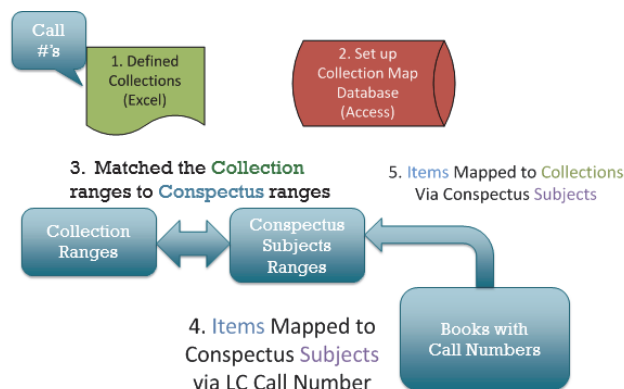


Figure 2. UNT collection map pathway.

## Methods Overview

At the onset of the development of the Collection Map, the collection ranges were defined based upon LCCNs within Excel. The second step undertaken was the transference of the Excel data into an Access database created by the Collection Assessment Librarian. Access was selected as the principal database for this process as Access is more efficient for showing the multiple relationships amongst the individual components. Additionally, Access also allows for greater maneuverability and manipulation of the created collections. The third step included mapping as closely as possible, the UNT Libraries's collection ranges to the WorldShare CES Conspectus subject ranges. The fourth step was the process of selecting what items, such as book with LCCNs,

can be assigned to the conspectus subjects. With a result that the selected items are indirectly mapped to the collection via the assigned conspectus subject. This process culminates with the selected items that can then be auto-matched to one range, which can reside in one or more collections as shown in Figure 3, “Overview of the methods used in developing the collection map.” Each of these steps are presented in more detail in subsequent sections.



**Figure 3. Overview of the methods used in developing the collection map.**

## Defining the Collections

As mentioned earlier, the initial set of ranges for each of the UNT Libraries’s collections was derived from the YBP approval plan, which was used as part of the initial UNT Libraries’s DDA profile. Historically, UNT had mapped funds to the approval plan. As such, the set of ranges to choose from was set by the YBP jobber, which did not necessarily match the Conspectus subject ranges as set by WorldShare CES. In that the WorldShare CES Conspectus ranges were specific in nature, while the UNT collection ranges were very broad. As mentioned earlier, the initial set of ranges for each of the UNT Libraries’s collections (see Figure 4) was derived from the

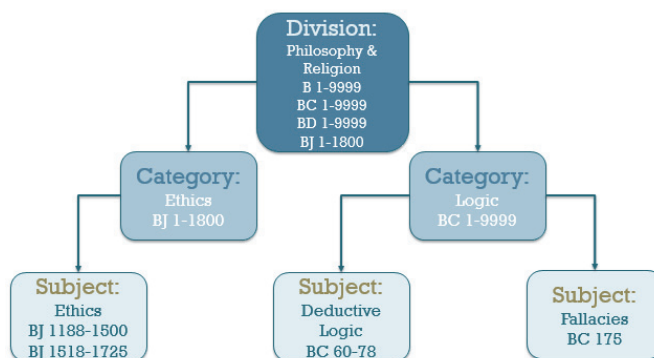
Collection	LC Class	LC Range
Accounting	HF	5601-5690
Accounting	HF	5691-5716
Aerospace Studies	TL	500-779
Aerospace Studies	TL	780-786
Aerospace Studies	TL	787-4050
Anthropology	BF	1404-2049
Anthropology	BL	660-2699
Anthropology	CC	1-960

**Figure 4. Original UNT collection ranges.**

YBP approval plan, which was used as part of the initial UNT Libraries’s DDA profile.

## Establishment of the Conspectus Hierarchy

A hierarchy was developed for the Conspectus subjects that consists of three levels: division, category, and subject. Within this hierarchy structure there is no overlap in the Conspectus subjects as shown below with a division category of Philosophy & Religion being very broad and subdivided into two categories consisting of Ethics and Logic. The categories of Ethics and Logic each contain their own subjects such as Deductive Logic and Fallacies under the category of Logic. Please see Figure 5, “UNT collection map conspectus hierarchy.”



**Figure 5. UNT collection map conspectus hierarchy.**

## Development of the Access Database

Due to the level of granularity within the WorldShare CES Conspectus, an Access Database was created to facilitate the establishment of relational tables connecting the divisions, categories, and subjects. Within this process each square as shown below in Figure 6, "UNT Collection Map Access database relationship tables," represents a table, and the lines between each table represent the links between the tables. Each of these tables contains the listings of Divisions, Categories, and Subjects as established by the Conspectus hierarchy. For example, the Conspectus Divisions are linked to the Conspectus Categories via the Conspectus Categories by Division table. As shown in the Conspectus Categories by Division table, there is a column for Division, which is the DivID from Conspectus Divisions table, and Category, which is the CatID from the Conspectus Categories table. Similarly,

the Subjects are linked to the Categories by the Conspectus Subjects by Categories table. Thus, all of the Subjects are related to all of the Categories, which are related to all of the Divisions.

## Mapping the WorldShare CES Conspectus to UNT Libraries's Collections

The next step in the process was to map the conspectus data to the UNT Libraries's collections as shown below in Figure 7, "Mapping of the WorldShare CES Conspectus to UNT collections." This phase used the call number mappings for the subjects that were developed based upon the approval plans with YBP. However, these ranges although similar were not identical to those defined in the Conspectus. Thus the decision was made to select the Conspectus subject that most closely approximated the YBP ranges. This phase of the development of the Collection Map

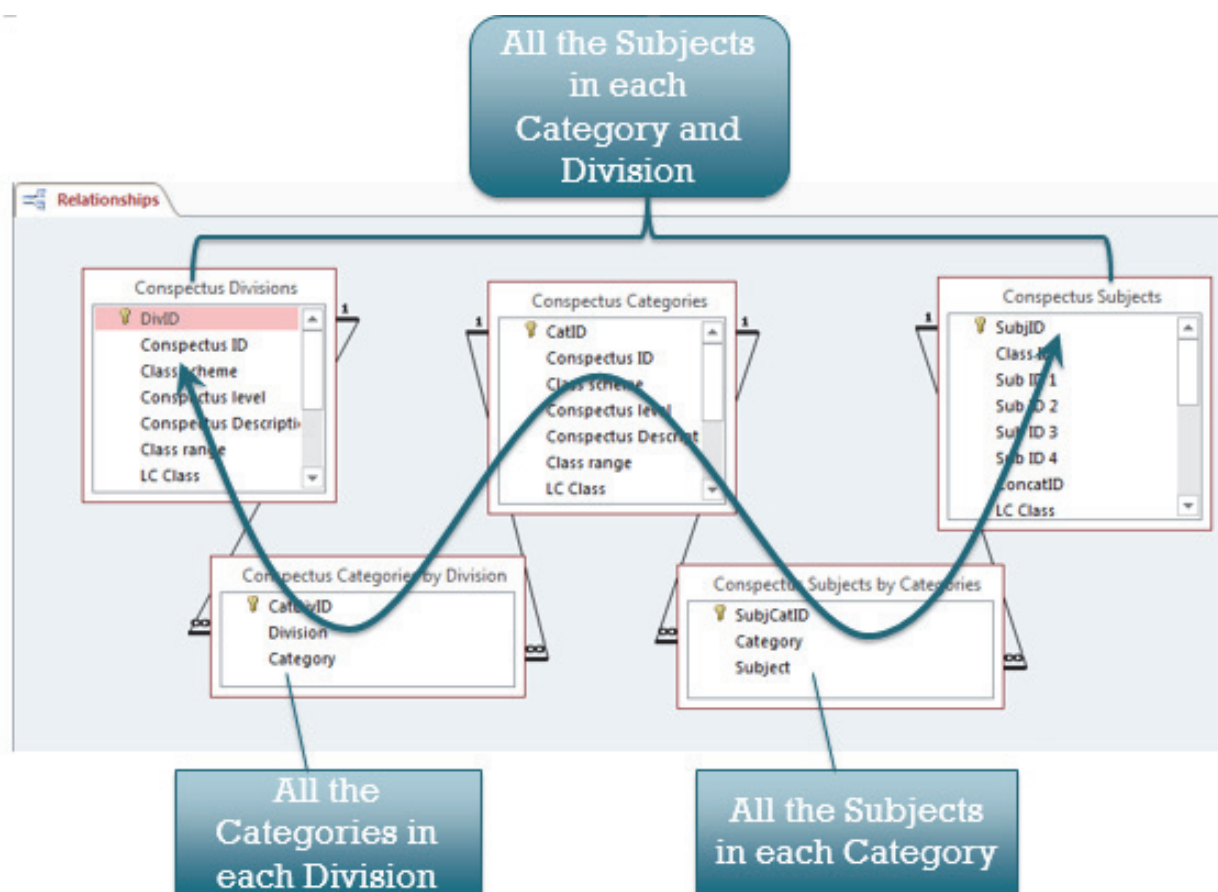


Figure 6. UNT collection map Access database relationship tables.



	B	C	D	G	H	I
1	Collection	LC Class	LC Range	Category	Subject	Conspectus Subject
2	Accounting	HF	5601-5690	Commerce	Accounting	HF5601-5686
3	Accounting	HF	5691-5716	Commerce	Business mathematics	N/A
4	Aerospace Studies	TL	500-779	Motor Vehicles, Aeronautics, Astronautics	Aeronautics. Aeronautical engineering	TL500-559; TL570-578; TL586-589; TL600-699; TL701-733; TL760-769;
5	Aerospace Studies	TL	780-786			TL780-785
6	Aerospace Studies	TL	787-4050	Motor Vehicles, Aeronautics, Astronautics	Astronautics. Space travel	TL787-795; TL796-798; TL875-954;
7	Anthropology	BF	1404-2049	Psychology, Parapsychology, Occult		BF1403-9999
8	Anthropology	BL	660-2699	Religion	History of principles of religions.	BL0-9999
9	Anthropology	CC	1-960	Archaeology (General)	n/a	CC1-960

Original Range

Closest Conspectus Range

Each range could be in 1+ Collections

Collection	Conspectus Subject
Women's and Gender Studies	HQ1101-2030
Sociology	HQ1101-2030
Educational Psychology	HQ1101-2030
Anthropology	HQ1101-2030
Women's and Gender Studies	HQ12-472
Psychology	HQ12-472
Educational Psychology	HQ12-472
Anthropology	HQ12-472
LGBT Studies	HQ12-472
Sociology	HQ12-472

Figure 7. Mapping of the WorldShare CES Conspectus to UNT collections.

A significant advantage of the new Collection Map system over that of the historic YBP approval plan is that an association could be made for the same LCCN range to more than one collection. This is illustrated within Figure 7, "Mapping of the WorldShare CES Conspectus to UNT collections," as the range of HQ1101-2030 is associated with Women's and Gender Studies, Sociology, Educational Psychology, and Anthropology.

## Mapping Items to the Conspectus

The fourth step in the process of the developing the Collection Map results in the assignment of the Conspectus subject for each item in a list that is based on the item's LC classification. In the example of DDA titles shown in Figure 8, "Assignment of Conspectus subjects by item," the LCCN is parsed into two parts—LC Class and Number. The Conspectus subjects are then automatically assigned based on the call number ranges defined earlier using an Access program written by the UNT Collection

DDA Titles

Parsed Call #

EbookID	LC Call Num	LC Call Parsed	LC Class	LC Num
32495	PN98.D43 E48 1995	PN 98 .D 43 E 48 1995	PN	98
108507	RA566 .M265 2013	RA 566 .M 265 2013	RA	566
110940	TK7867 .N65 2003	TK 7867 .N 65 2003	TK	7867
125684	LB2341 .D35 2011	LB 2341 .D 35 2011	LB	2341
134773	DC202.5 .G74 2003	DC 202 .5 .G 74 2003	DC	202
152401	GV865.D58 M66 1988	GV 865 .D 58 M 66 1988	GV	865
162997	HF3520.L65 G38 2001	HF 3520 .L 65 G 38 2001	HF	3520
				1404
				62

DDATitles

EbookID	LC Call Num	LC Call Parse	LC Class	LC Num	Conspectus
32495	PN98.D43 E48 1	PN 98 .D 43 E 4	PN	98	PN80-99
108507	RA566 .M265 2	RA 566 .M 265	RA	566	RA565-600
110940	TK7867 .N65 20	TK 7867 .N 65	TK	7867	TK7867-7868
125684	LB2341 .D35 20	LB 2341 .D 35	LB	2341	LB2341
134773	DC202.5 .G74 2	DC 202 .5 .G 74	DC	202	DC139-249
152401	GV865.D58 M6	GV 865 .D 58 M	GV	865	GV861-1017
162997	HF3520.L65 G3	HF 3520 .L 65 G	HF	3520	HF0-4998
167252	PE1404 .H363 2	PE 1404 .H 363	PE	1404	PE1001-1693

Figure 8. Assignment of Conspectus subject by item.

incur the highest level of personnel cost in the form of both labor and time, as the entire process was manually performed with a review and decision being made for each individual line item, thus effectively "mapping" the YBP ranges to the closest-matching Conspectus ranges.

Assessment Librarian. The Access program initially looks up the LC class in the list of Conspectus subjects, and then finds the subject that includes

Collection	EbookID	LC Call Num	Conspectus Description	Title
English	529305	PS3057.E6 M38	American Literature - 19th Century	An insect view of its plain
English	10387177	PB8803 .B65 20	English Literature - Provincial & Local - Ireland	Blighted beginnings
Psychology	10419977	RC506 .G76 200	Psychotherapy - Chemo-, Shock,Hypnosis,Ana	--but at the same time and on another level--
Counseling & Higher Education	10419977	RC506 .G76 200	Psychotherapy - Chemo-, Shock,Hypnosis,Ana	--but at the same time and on another level--
History	1987360	E183 .E39	History - United States, General Works	Dual containment policy in the Persian Gulf :
History	966527	DK268.4 .J85 20	Soviet Regime, 1918-1991	Enemies of the people under the Soviets :

Figure 9. Assignment of WorldShare CES Conspectus subject by item through Access tables.

the LC number within its range. By default, the outcome of this process is that items are automatically mapped to the Collection Map as shown in Figure 9, "Assignment of WorldShare CES Conspectus subject by item through Access tables."

This results in any one item being assigned to one or more collections. Further, this facilitates a truly interdisciplinary collection map with one to many relationships existing within the collections through the mapping of item-level data with LC call numbers as shown in Figure 10, "Assignment of WorldShare CES Conspectus subject by item." Within this process zero-sum thinking has been eliminated. Due to the nature of the Collection Map, the sum of titles by collection is greater than the actual number of titles.

## Improvements

Although this is a revolutionary process for UNT with significant areas of application, there are improvements yet to be realized within the process. A key area of improvement includes integrating resources currently without LC classification, such as interlibrary loan requests, media, and electronic resources into the Collection Map. Currently these items are being held in an "Excluded" category within the Collection Map. A second area of improvement is to review the UNT Libraries's collections to be more inclusive of related subjects. As part of the focus upon inclusivity, a proposal is to assign weights to the subjects by relevance based upon academic programs such as primary, which consist

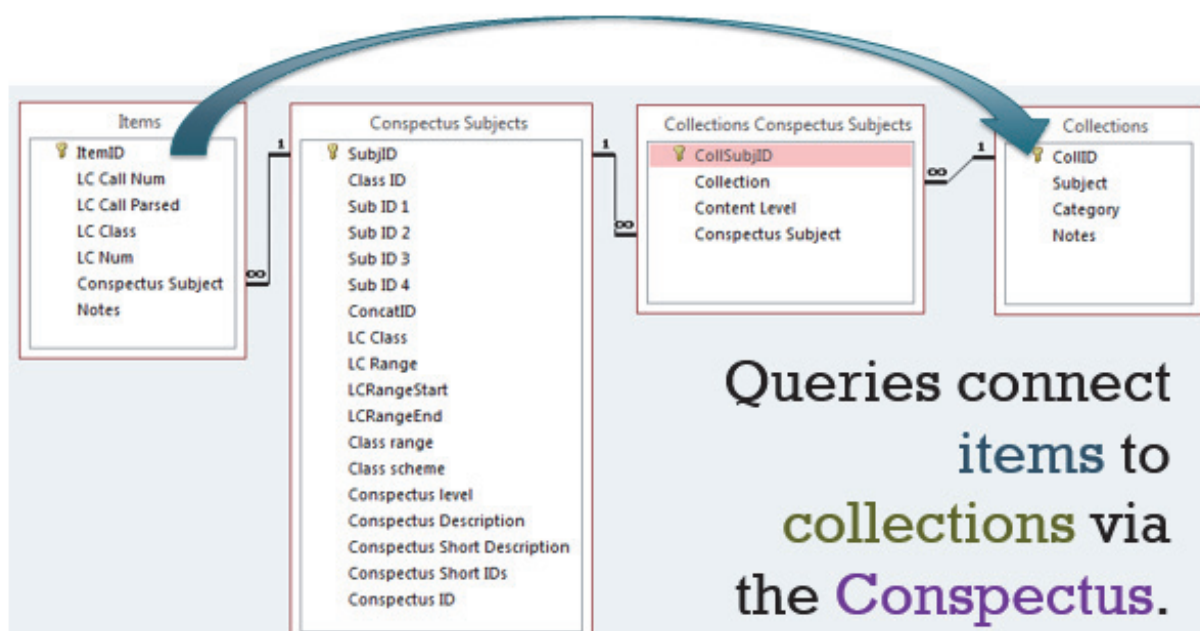


Figure 10. Assignment of WorldShare CES Conspectus subject by item.



of major topics related to the program, secondary weights, which would consist of minor topics related to the program, and tertiary weights, which would include required courses or supportive content. An example of this would be a program such as computer science, where items with a primary weight would contain computer-science-specific topics. Items with secondary weighting may include items and topics related to information technology, while the tertiary level would contain items and topics that support but are not specific to the program, yet that are still related in some way to computer science, such as mathematics. Within the proposal for a weighting structure it is clear that not all subjects are created equal, thus objective decision would need to be reached concerning both the weights to be applied and the placement of items within the weighted structure.

## **Utilization**

The UNT Collection Map has tremendous potential to be utilized in a myriad of areas, such as for accreditation reviews, within ongoing and future in-depth college and departmental assessments, as a tool facilitating institutional peer comparisons, and for the evaluation of expenditures at the department, college, and institutional levels. The UNT Collection Map can be rapidly updated at any time in response to external and environmental changes, thus more efficiently and effectively using the resources available to best meet the needs of the students, faculty, staff, and stakeholders.

## **Conclusion**

Through the development of the UNT Collection Map, a realistic and holistic picture of the UNT Libraries's collections is being created. No longer is the focus fixed on trying to assign one book or item to one designated area with many items' interdisciplinary nature going unrecognized. The creation of an interdisciplinary collection map facilitates a more realistic depiction of the UNT Library collections as a whole via its flexible, versatile, and sustainable framework. This is especially critical as we progressively continue to move toward an assessment- and evidence-based future.

The Collection Map structures collections data (usage, ILL borrowing, holdings, and more) in a way that makes sense to our local decision-making process. We have found this tool to be useful in answering the everyday questions that arise in the course of our collection development activities, such as how well we have supported a certain area of study, or whether a certain type of material has gotten historically high use. Challenges to using the Collection Map, ironically, center on its power and scope. We have so much data that it has been difficult to enfold it all into our selecting activities in a digestible, actionable way. We continue to work toward automation of the data and using our human resources efficiently to apply critical thinking to the numbers to create meaningful analysis.